

## Appendix B - Baseline ALARM Input Decks

This appendix identifies specific baseline data block configurations and data values necessary for executing the validation testing described in section 3. The source listings for these input data are shown following the tabular values.

### B.1 - DATAGANT

Radar Transmitter Antenna Pattern

Table B-1 DATAGANT Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATAGANT	Transmitter antenna gain data block
	FILNAM		Pathname of file containing antenna pattern data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRTTX	0	Print control variable (0 = do not echo input to output file)
	ISYMTA	0	Transmitter gain pattern symmetric in azimuth (0 = asymmetric)
	ISYMTE	0	Transmitter gain pattern symmetric in elevation (0 = asymmetric)
	DAZTXD	0.1°	Transmitter gain pattern azimuth increment
	DELTXD	0.1°	Transmitter gain pattern elevation increment
	TGANDB	42.5 dB	Boresight transmitter gain
	TGXMIN	0.0	Minimum gain of the transmitter antenna pattern
	ITXTYP	1	Antenna pattern is two dimensional
2	TGTABL(I,0)	See DATAGANT.BAS file listing later in this appendix	Gain relative to TGANDB at azimuth (I-1)*DAZTXD -180.0°
3	TGTABL(J,1)		Gain relative to TGANDB at elevation (J-1)*DELTXD -180.0°

**B.2 - DATAGANR**

## Radar Receiver Antenna Pattern

Table B-2 DATAGANR Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATGANR	Receiver antenna gain data block
	FILNAM		Pathname of file containing antenna pattern data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRTRX	0	Print control variable (0 = do not echo input to output file)
	ISYMRA	0	Receiver gain pattern symmetric in azimuth (0 = asymmetric)
	ISYMRE	0	Receiver gain pattern symmetric in elevation (0 = asymmetric)
	DAZRXD	0.1°	Receiver gain pattern azimuth increment
	DELRXD	0.1°	Receiver gain pattern elevation increment
	RGANDB	42.5 dB	Boresight receiver antenna gain
	RGXMIN	0.0	Minimum gain of the receiving antenna pattern
	RTXTYP	1	Antenna pattern is two dimensional
2	RGTABL(I,0)	See DATAGANR.BAS file listing later in this appendix	Gain relative to RGANDB at azimuth (I-1)*DAZRXD -180.0°
3	RGTABL(J,1)		Gain relative to RGANDB at elevation (J-1)*DELRXD -180.0°

**B.3 - DATA PLOT**

## Contour Plot Mode Target Data

Table B-3 DATAPLOT Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATAPLOT	Contour Plot mode target data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRPLT	0	Print control variable (0 = do not echo input to output file)
	RNGMAX	70,000.0 m	Maximum plot range
	DXYPLT	250.0 m	Plot range increment
	ZTPLOT	152.4 m	Target altitude (500 ft.)
	VTPLT	236.38 m/sec	Target speed
2	IAGLCN	1	Altitude expressed in meters Above Ground Level (AGL)
	PLTLAB		Title for output plot file
3	NOVRWR	1	Do not overwrite existing file
	PFINAM		Plot output filename

**B.4 - DATA RADR**

## Engineering-level Radar Data

Table B-4 DATARADR Data Block Values

Record	Variable	Value	Description
0	DATABLK	DATARADR	Engineering-level radar data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRRDR	0	Print control variable (0 = do not echo input to output file)
	IRADAR	1	Pulsed MTI radar
	ISQLAW	1	Radar detector type (1 = square law)
	IPOLAR	0	Antenna polarization (0 = vertical)
	NDELAY	2	Number of MTI delay lines
	NPRFS	2	Number of PRFs
	NFILTR	0	Number of Doppler filters
	NPULSE	33	Number of pulses non-coherently integrated
	NPOLES	0	Number of poles for Chebychev filter
	FMTIDB	26.0 dB	Minimum MTI power response
	NGATE	1	Number of MTI gates
2	PSUBT	200.0 kW	Radar transmitter power
	FREQIN	14875.0 MHz	Radar transmitter frequency
	PULWID	0.25 $\mu$ sec	Radar pulse width
	PCR	1.0	Pulse compression ratio
	BLANKT	0.25 $\mu$ sec	Transmitter blanking time after pulse transmission
	BWMHZ	6.0 MHz	Radar noise bandwidth
	RNFDB	12.0 dB	Radar receiver noise figure
3	TLOSDB	1.3 dB	Transmitter line loss
	RLOSDB	0.0 dB	Receiver line loss
	SLOSDB	11.27 dB	System line loss
	ALOSDB	0.0 dB	Antenna ohmic loss
4	ZTENNA	3.05 m	Radar antenna height
	AZMIND	-180.0°	Minimum azimuth pointing angle of antenna
	AZMAXD	+180.0°	Maximum azimuth pointing angle of antenna
	ELMIND	-10.0°	Minimum elevation pointing angle of antenna
	ELMAXD	+80.0°	Maximum elevation pointing angle of antenna
	BEAMWD	Not Used	3 dB beamwidth

Table B-4 (Continued)DATARADR Data Block Values

Record	Variable	Value	Description
5	CLCNST	10 <sup>-6</sup>	Quadratic decay constant
	SIGMAC	10 Hz	RMS clutter frequency spread
	DAZCLD	0.1°	Azimuth angle increment for computing clutter
	AZOCLD	3.0°	Maximum angle off-boresight for clutter
	PSUBFA	10 <sup>-6</sup>	Probability of false alarm
	PSUBD	0.9	Probability of detection
6	STCMXR	Not Used	Effective starting range for STC (m)
	STCMNR	Not Used	Maximum STC attenuation range (m)
	STCATN	Not Used	STC attenuation (m)
	CONSRT	0.0 Hz	Conical scan rate
	ANTRSD	0.0° / sec	Scan rate of antenna
	ASIDDB	0.0 dB	Chebyshev mainlobe/sidelobe difference
7	RMTIMN(I)	0.0 km	Minimum range for I-th MTI gate
8	RMTIMX(I)	100.0 km	Maximum range for I-th MTI gate
9	AMTIMN(I)	0.0 °	Minimum azimuth for the I-th MTI gate
10	AMTIMX(I)	360.0 °	Maximum azimuth for the I-th MTI gate
11	FILTBW(I)	0.0 Hz, 0.0 Hz	Filter band width for PRFHZ(I)
12	TIMINT(I)	0.0 sec, 0.0 sec	Radar integration time
13	PRFHZ(1)	2890 Hz	Radar pulse repetition frequency
	PRFHZ(2)	2717 Hz	
14	IFLMOD	0	Non-Fluctuating target type
	CHINDR	Not Used	Degrees of freedom for chi-squared or Weinstock target model
	CORELR	Not Used	Number of correlated blocks for chi-squared model
	SIGDBR	Not Used	Sigma parameter for log-normal distribution
	THOLDB	-380.0	User-defined detection threshold (-380 = ALARM to compute threshold)

NOTE: Specify a value of zero for any variable marked "Not Used".

**B.5 - DATA RCST**

## Target Radar Cross Section Data

Table B-5 DATARCST Data Block Values (1 m<sup>2</sup>Target)

Record	Variable	Value	Description
0	DATBLK	DATARCST	Target radar cross section data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRRCS	0	Print control variable (0 = do not echo input to output file)
	ISYM	1	Target RCS is symmetric in azimuth
	ISQM	1	Target cross section is in square meters
	NELFLC	1	Number of fluctuation sectors (elevation)
	NAZFLC	1	Number of fluctuation sectors (azimuth)
	RCSXDB	0.0 dB	RCS scale factor
2	TGFLEL(J+1)	(Records 2 and 3 are not used because NELFLC and NAZFLC are 1)	Starting elevation angle for second elevation sector
	TGFLEL(J+2)		Starting elevation angle for third elevation sector
	TGFLEL(J+3)		Starting elevation angle for fourth elevation sector
	TGFLEL(n)		Starting elevation angle for "n"th elevation sector
3	TGFLAZ(I+1)		Starting azimuth angle for second azimuth sector
4	ITTYPE(I,J)	0	Non-fluctuating target
	CHINDF(I,J)	0.0°	Number of degrees of freedom for chi-squared or Weinstock target model
	CORELD(I,J)	0.0°	Number of correlated blocks for chi-squared target model
	SIGDB(I,J)	0.0°	Sigma parameter of a log-normal distribution
5	DELAZD	180° for 1m <sup>2</sup> target	Azimuth increment for target RCS pattern
	DELELD	180° for 1m <sup>2</sup> target	Elevation increment for target RCS pattern
	ELMIN	-90°	Minimum elevation for RCS pattern
	ELMAX	90°	Maximum elevation for RCS pattern
6	RCSIN(I,J)	1.0, 1.0	Target RCS at azimuth (I-1*DELAZD)
7		1.0, 1.0	

Note: The artificial RCS was generated using draws from pseudo-random normal distribution with a mean of 0 dB (corresponding to a 1m<sup>2</sup> target) and a standard deviation of 1 dB (not too much fluctuation).

**B.6 - DATA REFL**

## Reflectivity Data

Table B-6 DATAREFL Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATAREFL	Terrain reflectivity data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRRFL	0	Print control variable (0 = do not echo input to output file)
	LCOVER	3	Lincoln Lab ground cover type "Rangeland"
	LFORM	8	Lincoln Lab land form type "Steep"
	ICLOPT	1	Clutter distribution uses the mean
	ISEED	0	Random number seed

**B.7 - DATA SEKE**

## SEKE Propagation Factor Data

Table B-7 DATASEKE Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATASEKE	Lincoln Lab SEKE control data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRSEK	0	Print control variable (0 = do not echo input to output file)
	IPPROP	0	Pattern propagation factor is a function only of the radar antenna pattern and does not depend on diffraction and multipath effects
2	EPSLN1	6.0	Dielectric constant of the terrain
	SIGMHO	0.006 mhos/m	Terrain conductivity
	RROUGH	0.9	Terrain roughness factor
	RKFACT	1.333333	Refractivity factor
	TAURIX	(Leave Blank – Used only when LCOVER= water)	Relaxation constant
	WNDKNO		Wind speed

**B.8 - DATA SITE**

## Radar Site Data

Table B-8 DATASITE Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATASITE	Radar site data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	IPRSIT	0	Print control variable (0 = do not echo input to output file)
	LATDRS	30	Site latitude degrees
	LATMRS	29	Site latitude minutes
	LATSRS	45	Site latitude seconds
	LONDRS	-86	Site longitude degrees
	LONMRS	44	Site longitude minutes
	LONSRS	30	Site longitude seconds

**B.9 - DATATITL**

## Title of the Run

Table B-9 DATATITL Data Block Values

Record	Variable	Value	Description
0	DATBLK	DATATITL	Title of ALARM run data block
	FILNAM		Pathname of file containing data block. (If this file is used, the records below will appear in that file, rather than here.)
1	TITLE		Title of the run





**B.17 - DATA REFL.BAS**

DATA REFL

0 3 8 1 0

**B.18 - DATA SEKE.BAS**

DATA SEKE

0 0  
6.0 0.006 0.9 1.3333333**B.19 - DATA SITE.BAS**

DATA SITE

0 302945 -864430

**B.20 - DATA TITL.BAS**

DATA TITL

(Run Title)

